



July 24, 2015

Ms. Diane McDaniel  
Environmental Engineering Manager  
Pennsylvania Department of Environmental Protection  
Southwest Regional Office  
400 Waterfront Drive  
Pittsburgh, PA 15222

Mr. Griff Miller  
USEPA Region 3  
RCRA Corrective Action (3LC30)  
1650 Arch St  
Philadelphia, PA 19103-2029

**Re: 2015 Raccoon Creek Area Groundwater Sampling Work Plan  
Former Lyondell Beaver Valley Site  
Lyondell Environmental Custodial Trust  
Potter Township, Pennsylvania**

Dear Ms. McDaniel and Mr. Miller,

On behalf of the Lyondell Custodial Trust (Trust), Tetra Tech Inc. (Tetra Tech) prepared this work plan to seek approval from the Pennsylvania Department of Environmental Protection (PADEP) and United States Environmental Protection Agency (USEPA) for the proposed groundwater sampling event in the Raccoon Creek Area at the Former Lyondell Beaver Valley Site (Site) in Potter Township, Pennsylvania. This sampling is being conducted at the request of PADEP and USEPA.

#### **SCOPE OF WORK**

The sampling event will include the collection and analysis of groundwater samples from the nine wells which remain in the Raccoon Creek Area. The table below summarizes the Raccoon Creek Area monitoring wells and Figure 1 shows the location of the wells.

**Tetra Tech, Inc.**

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Raccoon Creek Wells	
Well ID	Approximate Depth (feet)
MW-120	45
MW-150	47
MW-159	55
MW-161	42
MW-162	41
MW-163S	34
MW-501S	43
MW-501D	75
MW-502	19

During the sampling event each well will be inspected for damage. Prior to collecting the samples, a synoptic round of static groundwater levels will be measured in the wells. At each well, groundwater levels will be measured with an interface probe to determine water levels and the presence of either light or dense non-aqueous phase liquids. Water levels will be recorded to the nearest 0.01 foot. The measurements will be recorded in the field logbook. The water level meter will be decontaminated (sprayed with soapy [Alconox] water and rinsed with distilled water) between wells.

The monitoring wells will be sampled using low-flow purging and sampling techniques consistent with the PADEP Groundwater Monitoring Guidance Manual (Document Number 383-3000-001 December 1, 2001) as well as the USEPA Groundwater Guidance entitled, Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures (Document Number EPA/540/S-95/504 April 1996, revised January 19, 2010). However, given the time that has elapsed since these wells were last sampled, additional groundwater equivalent to one well volume will first be purged to increase the likelihood of representative sample collection. Tetra Tech used one well volume as a basis to increase the likelihood of sampling representative water but minimize the chance of disturbing the well.

A bladder pump equipped with disposable Teflon bladders and Teflon-lined polyethylene tubing, along with a flow-through cell, will be used to purge the wells. Monitoring wells will be purged at a rate of 0.5 liters per minute (lpm) or less. The depth to water in each well will be measured throughout purging so the flow rate can be adjusted to maintain a drawdown of less than 0.3 feet, if possible.

Field parameters will be monitored in the flow-through cell and recorded every five minutes on field log sheets. The field parameters and their corresponding stabilization criteria are summarized in the following table:

Field Parameter	Stabilization Criteria
pH	+/- 0.1 standard pH unit
Temperature	+/- 3%
Specific Conductance	+/- 3%
Dissolved Oxygen	+/- 10%
Turbidity	+/- 10%
Oxidation-Reduction Potential	+/- 10 mV

Purging will continue until the stabilization criteria are met for three consecutive measurements. Groundwater samples will be collected at a flow rate of 0.25 lpm from the pump discharge tubing. Dissolved metal samples will be field-filtered using a disposable in-line 0.45 micron filter. Samples will be collected directly into preserved laboratory-supplied containers, immediately placed into an ice-filled cooler, and packed for pickup by a courier from the project laboratory. After sampling the bladder pump will be decontaminated by washing with a mix of Alconox and water and rinsed with distilled water.

The samples will be analyzed for:

- Volatile organic compounds (VOCs) using EPA Method 8260
- Semi-volatile organic compounds (SVOCs) using EPA Method 8270
- Target Analyte List (TAL) total and dissolved metals plus manganese using EPA Method 6010 (7470 for mercury)

Quality assurance and quality control (QA/QC) samples will be collected during the sampling event at the following frequency:

- one trip blank per cooler per day;
- one field blank for the event;
- one blind duplicate sample for the event; and
- one matrix spike/matrix spike duplicate (MS/MSD) sample during the event.

The laboratory will be Pace Analytical Services in Greensburg, PA.

Purge water will be containerized in 55-gallon drums in a central location for characterization and disposal following completion of the groundwater sampling event. If the purge water is impacted such that it cannot be discharged to the surface, then Tetra Tech will coordinate with an approved disposal facility for the disposal of the purge water.

When the data is received from the laboratory, Tetra Tech will tabulate the results and compare the data to applicable PADEP and USEPA groundwater standards, which are:

- Pennsylvania Act 2 Medium Specific Concentrations (MSCs) - Non-residential groundwater MSCs for used aquifers with < 2,500 mg/l TDS.
- U.S. EPA Maximum Contaminant Levels (MCLs), if MSCs do not exist.

A letter report will be submitted to PADEP and USEPA by the end of 2015 and will summarize the sampling activities. The letter report will contain a narrative discussing the sampling event, figures, data tables, field log sheets, and the laboratory analytical report.

Field work should take no longer than one week to complete. It is anticipated that this work will take place in the fall of 2015 after cap maintenance is performed in the Raccoon Creek Area. After the cap maintenance is completed, this will allow for easier access to the wells.

## **CONCLUSION**

Tetra Tech is pleased to have the opportunity to continue to serve the Trust, PADEP, and USEPA on this project.

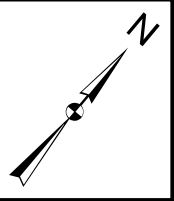
Sincerely,

 for

Keith Henn, PG  
Senior Project Manager



Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).



LYONDELL TRUST PROPERTY  
RACCOON CREEK WELL LOCATION  
BEAVER VALLEY, PENNSYLVANIA

DRAWN BY: K. MOORE 07/13/15  
CHECKED BY: J. AGLIO 07/14/15  
APPROVED BY:

CONTRACT NUMBER: 112IC07521

FIGURE NUMBER  
1

REVISION  
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